

DMS-6170, Polymeric Materials for Patching Spalls in Concrete Pavement

Overview

Effective Date: July 2003 – July 2004.

This Specification governs the quality monitoring program (QMP) for polymeric material for patching spalls in concrete pavement, and describes prequalification, quality monitoring requirements, disqualification and requalification, sampling and testing, and material requirements.

Material Description

Concrete patching material is a thermosetting polymer-based material mixed with aggregate to form a mortar used for patching spalls in concrete pavement.

Type I is a flexible material with high resilience properties. This material is not intended for use in areas where a concrete asphalt overlay is anticipated.

Type II is a semirigid material with a high compressive strength. The rigidity of this material is preferred when the concrete pavement will be repaved with a concrete asphalt overlay.

Prequalification

Prequalified Materials List

The Materials and Pavements Section of the Construction Division (CST/M&P) maintains a prequalified list of all materials conforming to the requirements of this program. Materials appearing on the prequalified list entitled "Polymeric Materials for Patching Spalls in Concrete Pavement" require no further testing unless deemed necessary by the Engineer. To obtain a place on the prequalified list the producer must be accepted into the QMP.

The material will be prequalified as a complete binder and aggregate system; thus, the list will include the binder and aggregate specified by the manufacturer. The Contractor, supplier, or producer cannot substitute any of the components without prior notice to and approval of CST/M&P.

Materials not appearing on the prequalified list require project specific testing and approval before use. Refer to 'Project Specific Testing.'

Prequalification Requests

Submit a written request to the Texas Department of Transportation, Construction Division, Materials and Pavements Section (CP51), 125 E. 11th Street, Austin, Texas 78701-2483, to prequalify your products. Include the following information in the request:

- company name,
- physical and mailing addresses,
- contact person and telephone number, and
- material type.

Performance History

CST/M&P will only accept into the QMP those materials that are determined by the Director of CST/M&P to have an established performance history and compliance with this Specification. Therefore, prospective producers or suppliers may be required to install their material at a test location. The Department must approve test sections before installation. Provide materials and installation for the test site at no cost to the Department. CST/M&P will monitor the test location for a minimum period of 12 mo. unless the material fails prematurely.

Prequalification Procedures

After the producer submits a request for QMP prequalification, CST/M&P will use the following procedure to prequalify the material:

The producer will provide a laboratory test report that contains data showing compliance of the material in accordance to the requirements in 'Material Requirements.'

The producer will submit a minimum of 1 sample (amount of binder components equal to 1 gal. of mixed material and corresponding aggregate) for consideration of each type of patching material.

CST/M&P will test each sample according to the tests outlined in 'Material Requirements.' CST/M&P will determine if there is an adequate correlation between the producer and CST/M&P test results. CST/M&P will reject the material if a correlation is not established or if the material does not meet the requirements.

CST/M&P will place materials meeting all requirements on the prequalified materials list. After acceptance, any changes in formulation or composition must be reported to CST/M&P. Material changes require resubmission for prequalification.

Quality Monitoring Requirements

The prequalification periods are from January 1st to June 30th and July 1st to December 31st of every year. During each prequalification period, the producer must provide 1 prequalification sample, and monthly quality control testing reports.

Monthly Quality Control Reports

The Department requires that all producers in the QMP perform quality control testing on their material. The Department requires that producers submit monthly quality control testing reports to CST/M&P for every prequalified material. The report must reflect the test data from each batch of prequalified material produced during that month regardless of the destination of the material. The monthly report must contain the following information:

- type of patching material,
- date of manufacture,
- batch number, and
- QM test results.

QM tests are those listed in 'Material Requirements.' Producers must submit reports by the first business day of every month. If no prequalified material is produced for a particular month, then submit a report stating no material was produced.

Prequalification Sample

Submit a sample of each prequalified material for every prequalification period at least 1 mo. before the beginning of the prequalification period to allow sufficient time for testing. Any material not submitted on time may be delayed in posting on the prequalified materials list.

Random Testing and Auditing

The Department reserves the right to conduct random sampling of prequalified materials for testing, and perform random audits of test reports. Allow Department representatives to sample from the manufacturing plant, the project site, and warehouse. Maintain a complete record of all test reports for the previous and current calendar year. CST/M&P reserves the right to inspect and approve the laboratory where the quality control testing is performed to ensure that all criteria for equipment and procedure compliance are met.

Disqualification and Requalification

A producer may be disqualified and removed from the prequalified materials list if 1 of the following infractions occurs:

1. material tested by CST/M&P fails to meet the requirements stated in this Specification,
2. the producer fails to properly submit complete monthly quality control testing reports or prequalification samples to CST/M&P, or
3. the producer fails to report changes in the formulation or composition of the material to CST/M&P.

If a material is disqualified, the producer will not be allowed to supply material to the Department for a period of 6 mo., or as determined by the Director of CST/M&P. After this time has expired, the producer must requalify to regain QMP status. Disqualification will only apply to the patching material type corresponding to the infraction.

To requalify after the 6-mo. disqualification period, the producer must submit a written request to CST/M&P. Include with the request a test report from an independent laboratory with data that certifies that the material meets the requirements in 'Material Requirements.' After receiving the request and test data, all requirements in 'Prequalification Procedures' will apply.

Sampling and Testing

The Department will sample in accordance with "Tex-734-I, Sampling Epoxy," and will test in accordance with 'Material Requirements.'

Costs of sampling and testing are normally borne by the Department; however, the costs to sample and test materials failing to conform to the requirements of this Specification are borne by the Contractor or supplier. This cost will be assessed at the rate established by the Director of CST/M&P and in effect at the time of testing.

Amounts due the Department will be deducted from monthly or final estimates on Contracts or from partial or final payments on direct purchases by the State.

Project Specific Testing

Materials not appearing on the prequalified list require project specific testing and approval before their use. Submit samples to CST/M&P with a certified test report from an independent laboratory with test data verifying that the material meets the requirements stated within this Specification. This material must not be used until testing is complete and material is approved.

Material Requirements

General Requirements

Both types of concrete pavement patching material have the following properties:

The patching material is able to carry traffic within 3 hr. of placement or as directed by the Engineer.

Concrete patching material is resistant to weather and abrasion.

The aggregate type used in the patching material will be those specified by the manufacturer.

The patching material has a skid-resistant finish (e.g., tining, broadcast sand).

The patching material has a nonreflective finish with similar color tone to concrete, and

Concrete patching material must be placed at substrate temperatures of 10°C (50°F) and rising.

Chemical Resistance

Manufacturers must submit a certified report indicating compliance to the following requirements for chemical resistance.

Chemical Resistance	
Chemical	Effects
Deicers	None
Motor oil	None
Sodium Chloride Solution (5%)	None
Hydraulic Brake Fluid	None
Standard: ASTM "D 471, Standard Test Method for Rubber Property-Effect of Liquids." 25°C (77°F) after 22 hr.	

Submit report before the material is accepted into the QMP. It is not required as a part of the monthly quality control reports, unless requested by CST/M&P.

Physical Requirements

Type I

Type I		
Test	Method	Requirements
Gel Time, min.	"Tex-614-J, Testing Epoxy Materials"	5 minimum – 60 maximum
Wet Bond Strength to Concrete, psi	"Tex-618-J, Testing Elastomeric Concrete"	100 minimum
Compressive Strength 24 hr. psi	ASTM "C 579, Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes," Method B	200 minimum
Compressive Stress @ 0.1 in., 7 days, psi	"Tex-618-J, Testing Elastomeric Concrete"	200 minimum
Resilience, %	"Tex-618-J, Testing Elastomeric Concrete"	90 minimum
Thermal Compatibility One cycle is 8 hrs. @ 60°C followed by 16 hrs. @ -21°C Determine results after 9 cycles.	ASTM "C884/ C884M, Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay," with modifications	No delamination or cracking

Type II

Type II		
Test	Method	Requirements
Gel Time, min.	"Tex-614-J, Testing Epoxy Materials"	1 minimum – 60 maximum

Wet Bond Strength to Concrete, psi	"Tex-618-J, Testing Elastomeric Concrete"	250 minimum
Compressive Strength 24 hr. psi	ASTM "C 579, Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes," Method B	2,000 minimum
Compressive Stress @ 0.1 in., 7 days, psi	"Tex-618-J, Testing Elastomeric Concrete"	2,000 minimum
Resilience, %	"Tex-618-J, Testing Elastomeric Concrete"	65 minimum
Thermal Compatibility One cycle is 8 hrs. @ 60°C followed by 16 hrs. @ -21°C. Determine results after 9 cycles.	ASTM "C884/ C884M, Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay," with modifications	No delamination or cracking

Packaging and Labeling

Package reactive components in airtight containers and protect from light and moisture. Package aggregates to protect them from moisture. Include instructions for mixing and application of the material, and include all safety information and warnings regarding contact with the components.

Labels must include the following information:

- type of material
- resin or hardener components
- brand name
- name of manufacturer
- ratio of components to be mixed by volume
- unique batch number
- date of manufacture and
- expiration date.